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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/734,768

12/12/2003

Jiong-Ping Lu

TI-36196

1785

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06/30/2005

TEXAS INSTRUMENTS INCORPORATED

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DALLAS, TX 75265

EXAMINER

GUERRERO, MARIA F

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

67

Office Action Summary

Application No.

10/734,768

Applicant(s)

LU, JIONG-PING

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 9-11 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response the amendment filed April 13, 2005.

Status of Claims

2. Claims 1-11 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besser et al. (US 6,773,978) in view of Mikagi (US 6,232,227).

Besser discloses forming a polysilicon gate structure (204) over a semiconductor body; forming a layer of nickel (220) over said semiconductor body including over said polysilicon gate structure, forming a capping layer (221) over said layer of nickel, said capping layer comprising a material with an affinity for boron; then, annealing the semiconductor body to completely convert said polysilicon gate structure into Nisi gate electrode, and removing said capping layer and unreacted portions of said layer of nickel. Please see figures 3-4f. Besser further teaches: wherein said capping layer comprises a transition metal-nitride; wherein said capping layer comprises TiN. Wherein said annealing step occurs at a temperature in the range of 400 C to 600 C. Further comprising the step of forming a gate dielectric (212) on said semiconductor body prior to forming the polysilicon gate structure such that said gate dielectric is located between

said semiconductor body and polysilicon gate structure. Besser further discloses wherein said removing steps comprises a wet etch. Please see discussion on Page 3 column 5, line 5 to column 7, line 35.

Besser is applied supra but lacks the anticipation of forming CMOS polysilicon gate electrodes and wherein said wet etch chemistry comprise a sulfuric acid and peroxide mixture. Examiner takes official notice that it is well known in the art to wet etch using a wet etch chemistry that comprises a sulfuric acid and peroxide mixture.

Mikagi discloses forming CMOS polysilicon gate electrodes (please see figure 1A). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time of invention to form CMOS polysilicon gate electrodes as taught by Mikagi, in view of the primary reference of Besser, because Mikagi teaches a similar invention in which a top portion of the gate electrode is converted into Nisi.

Allowable Subject Matter

4. Claims 6 and 9-11 are allowed.

Response to Arguments

5. Applicant's arguments filed April 13, 2005 have been fully considered but they are not persuasive. Claims 1-5 and 7-8 stand rejected.

6. Applicant argued that Besser clearly describes a cap layer being desirable for cobalt but not needed for nickel. However, Besser shows this as another exemplary implementation of the invention (col. 6, lines 11-20). Besser also teaches referring to Figures 4A-4F, it will be appreciated that nickel or other metal could alternatively be

used within the scope of the invention (Fig. 4A-4F, col. 6, lines 54-65). Therefore, a person of ordinary skill in the art would recognize that Besser shows the step of forming the cap layer over a layer of nickel prior to annealing to completely convert the polysilicon gate structure to NiSi is implied (Fig. 4A-4F, col. 4, lines 40-67, col. 5, lines 10-55, col. 6, lines 29-65). In addition, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971).

7. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

8. Furthermore, during patent examination, the pending claims must be "given *>their< broadest reasonable interpretation consistent with the specification." > In *re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. > In *re American Academy of Science Tech Center*, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)(The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must

give claims their broadest reasonable interpretation.) < This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) >; Chef America, Inc. v. Lamb-Weston, Inc., 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004). There is not evidence of any special definition to the terms recited on the claims; therefore, the claims have been interpreted according to plain meaning and giving the broadest reasonable interpretation.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 27, 2005

Maria Guerrero
MARIA F. GUERRERO
PRIMARY EXAMINER